

Seasonal Changes and Seasonal Regimen in Hippocrates

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Abstract:

When considering the cause of diseases, the Hippocratic authors paid much attention to the influence of seasonal factors. They had close observation of stars, winds and rains in order to take caution of the seasonal changes and they also made seasonal regimen for the prevention of diseases. The value of such description should not be ignored in the history of medicine. Compared to other works, it has its own uniqueness and its special meaning to some degree.

Key Words: Season, Change, Regimen, Hippocrates

This short paper will mainly focus on the understanding of seasons and their relationship with bodily health in the Hippocratic Collections. Why did the Hippocratic authors pay much attention to seasons? How did they predict diseases from the observation of seasons? What did they suggest for the prevention of seasonal diseases? At the same time, did they follow any principle in prescribing seasonal regimen? Is there any difference between the saying of Hippocrates and the saying of other works?

I should acknowledge that much work of this paper is based on the writing of Volker Langholf. In his *Medical Theories in Hippocrates -- Early Texts and the 'Epidemics'*, he specifically explored the seasonal factors in *Epidemics I-III*, which gave me great inspirations. In addition, the usage of the English translation of Hippocrates is completely relied on the edition of W.H.S. Johnes in the *Leob Classics*, although Littré's edition is more authoritative for the reference of original Greeks.

1. THE IMPORTANCE OF SEASONAL CHANGES

The doctrine that bodily health is greatly influenced by seasonal changes was held not only by Ancient Indians and Chinese, but also by Ancient Greeks. Herodotus said: "we generally get ill when things changes – and by 'things' here I mean especially, but not exclusively, the seasons." According to him, Libyans and Egyptians are "the most healthy people in the world" on the account that "the climate is very stable there."¹ The Hippocratic author of *Humors* said: "It is changes that are chiefly responsible for diseases, especially the greatest changes, the violent alterations both in the seasons and in other things. But seasons which come on gradually are the safest."² And the author of *Aphorisms* said: "It is chiefly the changes of the seasons which produce diseases, and in the seasons the great changes from cold or heat, and so on according to the same rule."³ Therefore, the effects of seasons should not be ignored by physicians. The author of *Airs, Waters and Places* said: "First he (a physician) ought to consider what effects each season of the year can produce; for the seasons are not at all alike, but differ widely both in themselves and at their changes."⁴

Most diseases come to the Crisis (κρίσις) at the time of seasonal changes, which will determine the improvement or the deterioration of the diseases, so physicians must have a careful observation of the seasonal changes. The author of *Airs, Waters and Places* said: "One should be especially on one's guard against the most violent changes of the seasons. ... The following are the four most violent changes and the most dangerous: – both solstices, especially the summer solstices, both the equinoxes, so reckoned, especially the autumnal. One must also guard against the risings of the stars, especially of the Dog Star, then of Arcturus, and also the

¹ Hdt. II.77.3 [Waterfield, R. (1998). p125.]

² Humor.XV. [Johnes 4.89.]

³ Aph. I.XVIII. [Johnes 4.107.]

⁴ Aer. I. [Johnes 1.71.]

setting of the Pleiades. For it is especially at these times that diseases come to a crisis. Some prove fetal, some come to an end, all others change to another form and another constitution.”⁵

2. OBSERVATION OF SEASONAL CHANGES (INDICATION OF THE STARS)

Ancient Greeks used stars to predict the changes of seasons, among which Pleiads, Sirius and Arcturus were most frequently mentioned in Hippocrates. The author of Regimen divided a year into four seasons according to the risings and settings of those stars: “Winter lasts from the setting of the Pleiads to the spring equinox, spring from the equinox to the rising of Pleiads, summer from the Pleiads to the rising of Arcturus, autumn from Arcturus to the setting of the Pleiads.”⁶

For ancient Greeks, the rising and setting of those stars had a significant meaning firstly for agriculture. Hesiod taught in Works and Days that “When the Atlas-born Pleiades rise, start the harvest – the plowing, when they set.”⁷ According to G.W. Most, the rising of the Pleiads was usually in the first half of May, while the setting of the Pleiads was usually in the late October or early November at that time.⁸

The heliacal rising of Sirius marked the flooding of Niles for Ancient Egyptians and the arrival of winter for the Polynesians, but it was a sign of summer for Ancient Greeks.⁹ It was the brightest star in the night sky, also known as the “Dog Star”. Romans thought that the emanation of the star would cause diseases in human and animals, especially in dogs, so they called those days “the Dog Days of Summer”.¹⁰ Homer said: “Brightly do its rays shine among the many stars in the dead of night, the star that men call by name the Dog of Orion. Brightest of all is he, yet he is a sign of evil, and brings much fever on wretched mortals.”¹¹ When Sirius appeared, it was surely a desperately hot summer, just time for wines. During this season, men were weakened, women were aroused and many diseases were brought. Hesiod said: “In the season of toilsome summer, at that time goats are fattest, and wine is best, and women are most lascivious – and men are weakest, for the Sirius parches their head and knees, and their skin is dry from the heat.”¹²

Arcturus was another star for the determination of seasons, which was usually first seen in the evening around the second half of February. Hesiod said: “When Zeus has completed sixty

⁵ Aer. XI. [Johnes 1.105.]

⁶ Reg.III. LXVIII. [Johnes 4.369.]

⁷ WD. 383. [Most, G.W. (2006). p119.]

⁸ Most, G.W. (2006). p119.

⁹ Holberg, J.B. (2007). pp. 41–42.

¹⁰ Holberg, J.B. (2007). pp. 16-17.

¹¹ Iliad. 22.33-37. [Murray, A.T. (1999). Volume II. p455.]

¹² WD. 582. [Most, G.W. (2006). p135.]

wintry days after the solstice, the star Arcturus is first seen rising, shinning brightly just at dusk, leaving behind the holy stream of Oceanus.”¹³ However, the heliacal rising of Arcturus, usually in the mid-September, heralded the beginning of Autumn. So the season of Arcturus generally meant autumn, time for the harvest of grapes. Hesiod said: “When Orion and Sirius come into the middle of the sky, and rosy-fingered Dawn sees Arcturus, then, Perses, pluck off all the grapes and take them home.”¹⁴

The observation of stars was very important, not only for farmers, but also for physicians, since a qualified physician should be able to predict the possible occurrence and development of diseases from the meteorological phenomena. The author of *Airs, Waters and Places* said: “For knowing the changes of the seasons, and the risings and settings of the stars, with the circumstances of each of these phenomena, he will know beforehand the nature of the year that is coming.”¹⁵ If the stars appeared normally, which indicated the regularity of seasons, the year would be healthy and diseases would have an easy crisis. The author of *Aphorisms* wrote: “In seasons that are normal, and bring seasonable things at seasonable times, diseases prove normal and have an easy crisis; in abnormal seasons diseases are abnormal and have a difficult crisis.”¹⁶

Surely, the observation of the Pleiads, Sirius and Arcturus to predict health was not an innovation by the Hippocratic physicians. As Volker Langholf had already pointed out, it had ancient roots, possibly evolved from primary religious rituals.¹⁷ It was said that the residents of Ceos had a custom to take observation of Sirius and to sacrifice a dog to Sirius and Zeus every year. Cicero said: “We possess information that the inhabitants of Ceos have the custom of diligently observing the rising of Sirius every year and of assessing, as Herakleides Pontikos writes, whether the year will be healthy or unhealthy: If the star rises darker and as it were covered with mist, he says, the heaven is dense and thick, so that its exhalation will be heavy and unhealthy; but if the star appears bright and shining, this signifies that the heaven is thin and pure and, therefore, healthy.”¹⁸ However, how did the Hippocrates physicians make prognosis of diseases from the observation of stars in practice? As a matter of fact, they rarely mentioned about this, except that “if the signs prove normal when the stars set and rise... the year is likely to be very healthy”.¹⁹

3.PREDICTION OF DISEASES FROM SEASONAL CHANGES (WINDS AND RAINS)

¹³ WD. 564. [Most, G.W. (2006). p133.]

¹⁴ WD. 609. [Most, G.W. (2006) . p137.]

¹⁵ Aer. II. [Johnes 1.73.]

¹⁶ Aph. III.VIII. [Johnes 4.125.]

¹⁷ Langholf, V. (1990). P167.

¹⁸ Cicero, *On Divinatione* I.130.

¹⁹ Aer. X. [Johnes 1.99.]

The writings about meteorological prognosis are mainly located in three treatises in Hippocrates: *Airs, Waters, Places*, *Aphorisms* and *Epidemics I*. It seems that those authors were more likely to make predictions from rains and winds rather than from stars. The year will be healthy “if there be rains in autumn, if the winter be moderate, neither too mild nor unseasonably cold, and if the rains be seasonable in spring and in summer”.²⁰ However, it is much complicated for other situations. Rains and winds must be carefully considered: dry or rainy, northerly or Southerly? Take one case as an example. The author of *Airs, Waters and Places* wrote: “If, on the other hand, the winter proves dry and northerly, the spring rainy and southerly, the summer cannot fail to be feverladen, causing ophthalmia and dysenteries.”²¹ The author of *Aphorisms* wrote the same: “As for the seasons, if the winter be dry and northerly and the spring wet and southerly, of necessity occur in the summer acute fevers, eye diseases and dysentery, especially among women and those with moist constitution.”²² In general, the writings of *Airs, Waters and Places* and *Aphorisms* keep parallel with each other. Five situations are considered in total:

Northerly/Dry (Winter) + Southerly/Rainy (Spring) = Acute Fevers/Eye Diseases/ Dysentery (Summer)

Southerly/Rainy (Winter) + Northerly/ Dry (Spring) = Abortion (Spring)

Southerly/Rainy (Summer) + Southerly/Rainy (Autumn) = Ardent Fevers (Phlegmatics/ Over Forty) + Pleurisy/Pneumonia (Bilious) (Winter)

Northerly/Dry (Summer) + Southerly/Rainy (Autumn) = Headaches/Coughs (Winter)

Northerly/Dry (Summer) + Northerly/Dry (Autumn) = Beneficial (Phlegmatic/Humid) + Harmful (Bilious Women)

It seems that there are two strange phenomena in this incomplete forecasting system. First, easterly winds and westerly winds are never mentioned here. Does it mean that Ancient Greece never blew any other winds? Of course not. We might find an explanation from *The Sacred Diseases*: “In fact the north and the south are the stronger than any other winds, and the most opposite, not only in direction but in power.”²³ In *Meteorology*, Aristotle also regarded winds from the north and the south as the predominant winds: “Most winds, as a matter of fact, are north winds (Boreae, βορραε) or south winds (Notus, νοτος).”²⁴ He further explained: “More generally these winds are classified as northerly or southerly. The west winds are counted as northerly, for they blow from the place of sunset and are therefore colder; the east

²⁰ Aer. X. [Johnes 1.99.]

²¹ Aer. X. [Johnes 1.99.]

²² Aph.III. XI. [Johnes 4.125.]

²³ Morb. Sacr.XVI. 2.171.

²⁴ Mete. 361a5-10

winds as southerly, for they are warmer because they blow from the place of sunrise.”²⁵ That might be the reason why easterly winds and westerly winds are generally concealed in Hippocrates.

Second, the combinations of Northerly/Rainy and Southerly/Dry are totally neglected here. Why the north wind is always associated with dry weather, while the south wind is always associated with rainy weather? Some clue might be found also in *The Sacred Diseases*: “For it (the north wind) separates the moist and the dull from everything, including men themselves, for which reason it is the most healthy of the winds. But the action of the south wind is the opposite.”²⁶ The north wind separates the moist from everything and makes things dry, so it is always associated with dry weather. Well, the south wind has the opposite effect. Volker Langholf pointed out that this seemed to be an ancient folk tradition.²⁷ In Homer’s *Iliad*, the north wind “dries a freshly watered orchard”,²⁸ while the south wind “pours a mist over the peaks of a mountain”.²⁹ Aristotle said in *Meteorology*: “Everywhere, except in Pontus, dew is found with south winds and not with north winds.”³⁰

However, the combinations of Northerly/Rainy and Southerly/Dry are mentioned in *Epidemics*. The author of *Epidemics I* recorded the weather of Thasos and the occurrence of diseases for three years in detail.³¹ There is another instance in *Epidemics III*.³² The four cases which were recorded in *Epidemics* can be summarized like this:

Southerly/Rainy (Autumn) + Southerly/Dry (Winter) + Southerly/Dry (Spring) + Southerly/Dry (Summer)

The Most Dangerous Disease: Consumption (Summer)

Southerly/Northerly/Rainy (Autumn) + Northerly/Rainy (Winter) + [Northerly/Rainy (the Solstice)] + Northerly/Rainy (Spring) + Northerly/Rainy (Summer)

The Most Dangerous Disease: Continuous Fevers (Autumn/Winter)

Northerly/Rainy (Autumn) + [Southerly/Rainy (the equinox)] + Northerly/Dry (Winter) + Northerly/Dry (Spring) + Northerly/Dry (Summer)

The Most Dangerous Disease: Ardent Fevers (Autumn)

²⁵ *Mete.* 363b20-25

²⁶ *Morb. Sacr.* XVI. [Johnes 2.173.]

²⁷ Langholf, V. (1990). P174.

²⁸ *Iliad.* 21.346. [Murray, A.T. (1999). Volume II. p431.]

²⁹ *Iliad.* 3.10. [Murray, A.T. (1999). Volume I. p129.]

³⁰ *Mete.* 347a1-5

³¹ *Epid.* I. I. [Johnes 1.147]; IV. [Johnes 1.153]; XIII. [Johnes 1.165.]

³² *Epid.* III. CH.II. [Johnes 1.239.]

Southerly/Rainy (Autumn) + Southerly/Rainy (Winter) + [Northerly /Dry (the Equinox)] + Southerly/Rainy (Spring) + Southerly/Dry (Summer) + [Northerly/Rainy (Arcturus)]

The Most Dangerous Disease: Consumption (Spring/Autumn)

Volker Langholf noticed that none of the combinations of weather changes in *Airs, Waters, Places* reoccured in *Epidemics I* and *III*. The incomplete cases in *Airs, Waters, Places* and *Aphorisms* had no application in *Epidemics I* and *III* at all, although there were no contradictions between them.³³ It shows that the Hippocratic authors didn't intend to construct a general theory that can be applied into all situations. Thus it is still unclear about the method depending on which they might predict diseases from the observation of weather changes. It is more ambiguous about how they might forecast weather changes from diseases in reverse, since the author of *Aphorisms* said: "As it is possible to infer diseases from the seasons, so occasionally it is possible from diseases to forecast rains, winds and droughts; for example, north winds and south winds."³⁴

4. HOW THE SEASONAL CHANGES EFFECT THE BODILY HEALTH?

Then, how the seasonal changes aroused diseases? The author of *Airs, Waters, Places* thought that the weather changes influenced the body mainly on brain and veins, especially on the hardness and relaxation of the brain and veins. He said: "For whenever, owing to the winter being southerly and the body warm, neither brain nor veins are hardened, just at the time when it ought to have been relaxed along with soring and purged by cold in the head and hoarseness, congeals and hardens, so that the heat of summer having suddenly supervened and the change supervening, these diseases befall."³⁵ This "Hard-Relax" pattern that healthy is determined by the degree of hardness and relaxation of the body reminds us of the doctrine of the later Mothodism that "if the body is constricted, it has to be relaxed".³⁶

However, the author of *Nature of Man* used the four humors to explain the diseases caused by seasonal changes. The four humors, phlegm, blood, yellow bile and black bile, prevail respectively in winter, spring, summer and autumn and thus bring seasonal diseases. For example, phlegm has a nature of moist and cold, which is adapted to the character of winter, so it is most vigorous in that season. "Phlegm increases in a man in winter; for phlegm, being the coldest constituent of the body, is closest akin to winter."³⁷ In reverse, phlegm reaches the lowest amount in summer because it has a contrast nature with that season. "But in summer phlegm is at its weakest. For this season is opposed to its nature, being dry and warm." ³⁸

³³ Langholf, V. (1990). p179.

³⁴ Aph.III. XIV. [Johnes 4.127.]

³⁵ Aer. X. [Johnes 1.101.]

³⁶ Prooecium 57. [Spencer, W.G. (1935). p31.]

³⁷ Nat. Hom. VII. [Johnes 4.19.]

³⁸ Nat. Hom. VII. [Johnes 4.21.]

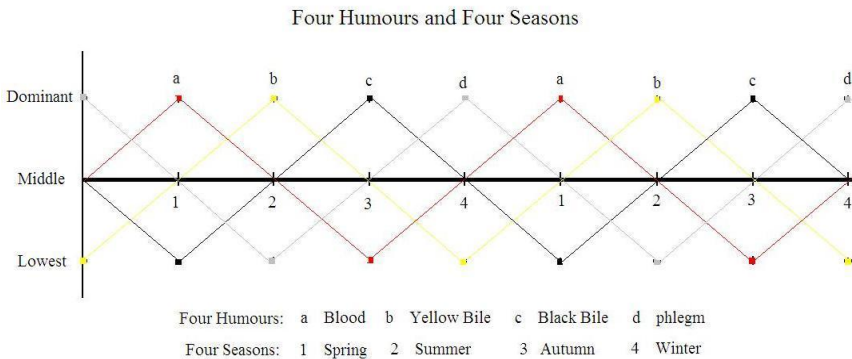
Therefore, phlegmatic diseases are usually aroused in winter, and will be naturally cured in summer in most cases. “Such diseases as increase in the winter ought to cease in the summer, and such as increase in the summer ought to cease in the winter.”³⁹ In a word, there is a correspondence between the four humors and the four seasons:

Phlegm (Cold + Moist) = Winter (Cold + Moist)

Blood (Hot + Moist) = Spring (Hot + Moist)

Yellow Bile (Hot + Dry) = Summer (Hot + Dry)

Black Bile (Cold + Dry) = Autumn (Cold + Dry)



(Diagram 1: The Changing of Humours with Seasons)

It is obvious that the author of *Nature of Man* only abstracted some general characters of each season and ignored other complicate factors. For example, he had never mentioned the influence of rains, winds and stars, which appeared frequently in *Airs, Waters, Places* and *Epidemics I and III* for the discussion of seasonal diseases. However, the explanation of *Nature of Man* has its advantage to integrate the theory of seasonal changes with the core doctrine of the four humors perfectly. The two patterns of explanations have clear distinctions:

(1) The “Hard-Relax” Pattern (*Airs, Waters, Places*):

Winds/Rains → the Brain → the Veins → Hardness / Relaxation → Diseases

(2) The Four Humors Pattern (*Nature of Man*) :

Seasonal Changes → Hot/Cold Dry/Moist → the Four Humors → Diseases

Volker Langholf thought that *The Sacred Disease* followed the same physiological mechanism as that of *Airs, Waters, Places*.⁴⁰ It is seemingly true since the author of *The Sacred Disease*

³⁹ Nat. Hom. VII. [Johnes 4.23.]

⁴⁰ Langholf, V. (1990). P175.

mentioned that “a south wind relaxes and moistens the brain and enlarge the veins”.⁴¹ However, looking through the whole treatise, we can find that the author emphasized more on “Dry/Moisture” rather than “Hard/Relax”. Epilepsy was mainly explained by the overabundance of moisture and the plethora of phlegm in the brain. “The brain is unnaturally moist, and flooded with phlegm.”⁴² Thus, the explanation of The Sacred Disease is more likely to follow the four humors pattern: the South Wind → Increase of the Moisture → Excess of the Phlegm → The Corruption of the Brain → Epilepsy.

5. SEASONAL REGIMEN AND THE PREVENTION OF DISEASES

Although diseases are most likely to happen during seasonal changes, they are not irresistible if a well regimen is adopted according to seasons. The author of Regimen in Health said: “So in fixing regimen pay attention to age, season, habit, land, and physique, and counteract the prevailing heat or cold. For in this way will the best health be enjoyed.”⁴³ Then, how to adopt a good regimen according to seasons in order to prevent diseases?

Two treatises in Hippocrates talked about seasonal regimen intensively: Regimen in Health and Regimen III, in which regimen generally consists of two parts: diet and exercise. Diet was very important in ancient Greek medicine both for prevention and therapy. Celsus told us that treatment through diet enjoyed the greatest reputation among the three parts of medicine: Diet(Διαίτητική), Pharmacy (Φαρμακευτική) and Surgery (Χειρουργία)⁴⁴. Here, however, we only discuss the preventive diet according to seasons.

It's not necessary to repeat the detail descriptions of seasonal regimen in Hippocrates, but we can take an abstract to have a general look. First, it is obvious that regimens are totally different in winter and in summer, clearly in reverse. The author(s) told us that we should eat “as much as possible” and drink “as little as possible” in winter, but “avoid as far as possible surfeits of food” and drink “as copious as possible” in summer. Exercises should be “many and of all kinds” in winter, but limited in summer in order to “avoid overheating as much as possible”. Sexual intercourse should be “more frequent” in winter, but “reduced to a minimum” in summer.⁴⁵ Second, the seasonal regimen emphasized on gradual instead of sudden change. “The change to be slight, gradual and not sudden”.⁴⁶ “Regimen may not be changed suddenly.”⁴⁷ So spring and autumn are the middle transitional stages in which regimen should be changed gradually from winter to summer in spring and from summer to winter in autumn. For example, in spring, food should be decreased and drink should be

⁴¹ Morb. Sacr.XVI. [Johnes 2.173.]

⁴² Morb. Sacr.XVI. [Johnes 2.169.]

⁴³ Reg.H. II. [Johnes 4.49.]

⁴⁴ Prooecium 9. [Spencer, W.G. (1935). p7.]

⁴⁵ Reg.H. I. [Johnes 4.45-51]; Reg. III.LXVIII. [Johnes 4.368-381.]

⁴⁶ Reg.H. I. [Johnes 4.45.]

⁴⁷ Reg. III.LXVIII. [Johnes 4.375.]

increased gradually. In fact, it appears that many Hippocratic authors emphasized on the gradualness of change, just as the saying of Aphorisms: “little by little is a safe rule, especially in cases of change from one thing to another.”⁴⁸

Then, we may ask, why the Hippocratic author(s) gave us such a regimen? Did they follow any principle in prescribing the seasonal regimen? With a close examination of the context, we can find that the author(s) followed two principles for diets: the theory of four qualities and the doctrine of balance. The four qualities – hot, cold, dry, moist – are applied to identify the characteristics of foodstuffs as well as seasons. Seasonal regimen just means a counteraction between seasons and diets. For example, winter is usually moist and cold, so the diet should be “of a drying nature, of a warming character” for balance.⁴⁹ That’s why wheaten bread is preferred to barley cake, undiluted wine is preferred to diluted wine, and roasted meat is preferred to boiled meat in winter. Similarly, the activities should also follow the same principles. For example, since summer is hot and dry, people should bathe more frequently. “Accordingly these conditions must be counteracted by way of living.”⁵⁰ In addition, diets and exercises form another counteraction, since nutrition is supplied by foodstuffs and used up in activities. Taking more food in winter means that we should have more exercise in that season.

	Food	Drink	Meat	Vegetable	Sports	Bathe	Sex
Winter	↑	↓	↑	↓	↑	↓	↑
Spring	↘	↗	↘	↗	↘	↗	↘
Summer	↓	↑	↓	↑	↓	↑	↓
Autumn	↗	↘	↗	↘	↗	↘	↗

(Table 1: Seasonal Regimen in Hippocrates)

[Notes: ↑ increase; ↓ decrease; ↘ ↗ gradual change]

	Food	Drink	Meat	Sports	Purge
Winter	Wheatean Bread	Undiluted Wine	Roasted Meat	Run and Wrestle	Emetics
Summer	Barley Cake	Diluted Wine	Boiled Meat	Walking	Clysters

⁴⁸ Aph.II.LI. [Johnes 4.121.]

⁴⁹ *Reg. III.LXVIII.* [Johnes 4.368.]

⁵⁰ *Reg.H. I.* [Johnes 4.45.]

(Table 2: Different Regimen in Winter and Summer)

	Nature of Seasons	Nature of Regimen
Winter	Cold + Moist	Hot + Dry
Spring	Hot + Moist	Cold + Dry
Summer	Hot + Dry	Cold + Moist
Autumn	Cold + Dry	Hot + Moist

(Table 3: The Counteraction of Seasons and Regimen)

The descriptions of seasonal regimen are almost the same in Regimen in Health and Regimen III, but the statement of Aphorisms has some differences. First, the author of Aphorisms used the concept of innate heat (εμφυτος θερμος), which was not mentioned in the other two treaties, to explain why we should eat as much as possible in winter. He said: “Bowels are naturally hottest in winter and in spring, and sleep is then longest; so it is in these seasons that more sustenance is necessary. For the innate heat being great, more food is required.”⁵¹ “In summer and in autumn food is most difficult to assimilate, easiest in winter, next easiest in spring.”⁵² Second, the author(s) of Regimen in Health and Regimen III ordered emetics in winter and clysters in summer, while the author of Aphorisms required clysters in winter and emetics in summer. The author of Regimen in Health said: “Use emetics during the six winter months, for this period engenders more phlegm than does the summer, and in it occur the diseases that attack the head and the region above the diaphragm. But when the weather is hot use clysters, for the season is burning, the body bilious, heaviness is felt in the loins and knees, feverishness comes on and colic in the belly. So the body must be cooled, and the humours that rise must be drawn downwards from these regions.”⁵³ However, the author of Aphorisms said just in reverse: “In summer purge by preference upwards, in winter downwards.”⁵⁴ He didn’t give any explanation for this, thus I suppose that he just made a mistake here out of his careless, not really intending to put out an opponent theory.

6. COMPARISON WITH OTHER WORKS IN ANCIENT GREEK MEDICINE

The pseudo-Aristotle work *Problemata* also discussed much about the influence of seasonal changes on diseases, especially in the Book I, 1-29(859a-863a). It is obvious that the questions and answers followed the footsteps of the Hippocratic authors, since most of the discussions have corresponding contents in Hippocrates. The author of *Problemata* also dealt with the stars

⁵¹ Aph. I.XV. [Johnes 4.105.]

⁵² Aph. I.XVIII. [Johnes 4.107.]

⁵³ Reg.H.V. [Johnes 4.51.]

⁵⁴ Aph. IV.IVI. [Johnes 4.135.]

(the Pleiads, Sirius and Arcturus), winds and rains, and also prescribed a regimen that “little solid but much liquid is needed in summer”.⁵⁵ However, there still exist some slight differences. For example, the author of *Problemata* thought that people are prone to sickness both in spring and in autumn because the weather changes, changing from cold to hot in spring and from hot to cold in autumn.⁵⁶ But the Hippocratic author of *Aphorisms* regarded spring as the most healthy season: “It is in autumn that diseases are most acute and, in general, most deadly; spring is most healthy and least deadly.”⁵⁷ Moreover, the author of *Problemata* had a much more clear statement about the relationship between seasons and diseases: “Seasons have hot, cold, dry and wet; diseases of excess, health of balance.” He regarded it as a general principle because “the change of winds, age and places, in a sense, is also a change of seasons”.⁵⁸

Celsus’ *De Medicina* also talked about seasonal regimen, although not so much. Frankly to say, it seems that Celsus just repeated the teaching of Hippocrates. He also taught that foods and drinks should be “hot or heat-promoting” in winter. He also regarded autumn as the most dangerous season: “In autumn owing to changes in the weather there is most danger”. The only difference is that Celsus adopted a different regimen for summer that “the body requires both food and drink oftener” and “both meat and vegetables are most appropriate”.⁵⁹

We have good reason to expect the rhetorical talking of Galen on this matter. However, it is a surprise that we can hardly find any useful information related to seasons in his voluminous writings. He had no word about the influence of seasonal changes on the four humors in his physiological book *On the Natural Faculties* (*De Naturalibus Facultatibus*); he mentioned nothing about meteorological prognosis in his therapeutic book *On Prognosis* (*De Praenotina*); and he even totally ignored seasonal regimen in his dietetic book *On the Properties of Foodstuffs* (*De alimentorum facultatibus*). We can neither hardly find any discussion about seasons in Herophilus, although he had also written a treatise called *Regimen*. It shows that not all Greek physicians paid equal attention to the seasonal factors as did the Hippocratic authors.

7. COMPARISON WITH ANCIENT CHINESE AND INDIAN MEDICAL WORKS

It’s really impressive that we can even find parallels of Hippocrates in the ancient Chinese medical work *Nei Jing*⁶⁰ and the ancient Indian medical work *Caraka-Samhita*⁶¹, especially on the descriptions of seasonal changes and seasonal regimen. They share many similarities that

⁵⁵ *Problemata*, I. 863b24-25.

⁵⁶ *Problemata*, I. 862b13-16.

⁵⁷ *Aph.* IX. [Johnes 4.125.]

⁵⁸ *Problemata*, I. 859a10-25.

⁵⁹ *De Medicina*, Book I.3.34. [Spencer, W.G. (1935). p67.]

⁶⁰ See Veith, I. (1966); Unschuld, P.U. (2003).

⁶¹ See Sharma, P. (1982); Wujastyk, D. (1998).

worth to be mentioned here. Firstly, they all emphasized on the influence of seasons, places and climates, which could characterize them equally as holistic medicine(s). Secondly, they all tried to use natural explanations without the involvement of gods or divine powers to the popular diseases which were caused by seasonal changes, although they used different terms. In this sense, they should be equally regarded as rational medicine(s). Thirdly, they all had the idea that the change of seasons would disturb the balance of human body and thus arouse problems. It is noticeable that the thought of balance, balance of the three dosas (pitta, vitta, kappa), the four humors (blood, phlegm, yellow bile, black bile) and the five phases (jin, mu, shui, huo, tu), was crucial for all ancient medicine(s). Lastly, they all emphasized on seasonal regimen which would counteract the influence of seasons and retune the body into a state of harmonious.

Here, however, we are looking for the differences. It is first remarkable that Chinese had a totally different regimen in contrast with Greeks and Indians. Both Hippocrates and Caraka-Samhita taught that we should take more activities in winter and have less work in summer. On the contrary, Nei Jing taught that we should keep quiet in winter and do things in summer. This might be explained by geographical differences and climatic diversities, but I don't think that's the fundamental reason. If we look into this matter, we can find that the doctors prescribed such a different regimen essentially because they had different ways of thinking. Ancient Greeks and Indians avoided hard work in summer because of the hotness, and moreover, they explained that the Sirius or the Sun took away human's energy. While, ancient Chinese reduced activities in winter not for the fear of coldness, but because plants were withered and animals took hibernation in that season. They thought that they were part of the nature, formed by the heaven and the earth, so their lives should imitate other living creatures according to the universal principle – Dao. Since plants and animals “hide” themselves in winter, humans should also have their “winter sleep”. This kind of thinking is surely different from ancient Greeks and Indians.

Another difference, which might be more important, is the absence of the concept of “tastes” in Hippocrates, while ancient Indians and Chinese regarded it as a very important concept and used it to distinguish foodstuffs for seasonal regimen. Caraka-Samhita divided a year into six seasons and gave each season a dominant taste (rasa): the Sweet in winter season, the Bitter in cold season, the Astringent in spring season, the Pungent in summer season, the Sour in rainy season, and the Salty in autumn season. Foodstuffs were classified into six categories according to their tastes, thus they combined seasonal regimen. Similarly, Nei Jing divided a year into five seasons and also gave each season a dominant taste (wei): the Sour in spring, the Bitter in summer, the sweet in long-summer, the Pungent in autumn, and the Salty in winter. Foodstuffs were sorted out into five species according to their tastes, thus they formed seasonal regimen. In a word, the construction of seasonal regimen was based on the “tastes” in both ancient Chinese and Indian medicine(s).

	Taste of Seasons	Taste of Regimen	Suitable Foodstuffs
Winter Season	Sweet	Sweet, Sour, Salty	Honey, Milk, Fat, Rice
Cold Season	Bitter	Sweet, Sour, Salty	Honey, Milk, Fat, Rice
Spring Season	Astringent	---	Venison, Rabbit, Antelope
Summer Season	Pungent	Bitter, Astringent	Birds Meat, Ghee, Milk
Rainy Season	Sour	Sour, Salty	Barley, Wheat, Rice
Autumn Season	Salty	Sweet, Bitter	Venison, Rabbit, Barley

(Table 4: Seasonal Regimen in Caraka-Samhita)

	Taste of Seasons	Taste of Regimen	Suitable Foodstuffs
Spring	Sour	Sweet	Plum, Chicken, Wheat
Summer	Bitter	Sour	Apricot, Sheep, Panicum
Long-Summer	Sweet	Salty	Jujube, Cattle, Millet
Autumn	Pungent	Bitter	Peach, Horse, Rice
Winter	Salty	Pungent	Chestnut, Swine, Bean

(Table 5: Seasonal Regimen in Nei Jing)

It seems that the Hippocratic authors almost wholly ignored the tastes of food. Of course, they surely knew the existence of different tastes, but they didn't realize their values for medicine, especially for regimen. In the whole Hippocratic collection, only one place clearly mentioned the taste of "sweet",⁶² and another place vaguely referred to "a harsh wine".⁶³ It is interesting that the Hippocratic authors emphasized so much on the experience of tactile sensation that they could even build the whole medical system on the theory of hot, cold, dry and moist, while they belittled the experience of gustatory sensation into such a trivial matter that they didn't even pay any pitiful attention to it.

However, Aristotle classified seven kinds of tastes in his book *On Sense and the Sensible*: the Sweet, the Salty, the Bitter, the Harsh, the Pungent, the Astringent, and the Acid.⁶⁴ Among the five senses (sight, hearing, smell, taste, touch), Aristotle took touch as the most indispensable

⁶² Nutriment. XXVII. [Johnes 1.353.]

⁶³ Reg.III. LXX. [Johnes 4.387.]

⁶⁴ De Sen. 442a20-25.

one, without which it is impossible for an animal to be.⁶⁵ Essentially, touch is a sense for food, as he said in *De Anima*: “All animals have the sense for food; the food of all living things consists of what is dry, moist, hot, cold, and these are the qualities apprehended by touch; all other sensible qualities are apprehended by touch only indirectly. ... Hunger and thirst are forms of desire, hunger a desire for what is dry and hot, thirst a desire for what is cold and moist; flavour is a sort of seasoning added to both.”⁶⁶ He thought that taste is also a sort of touch, because “all the qualities of the tangible qua tangible are perceived by us through touch.”⁶⁷

Galen also paid some attention to tastes in his book *On the Properties of Foodstuffs*, even if he had no discussion on seasons. He concluded four kinds of tastes: the Sweet, the Salty, the Bitter, the Sour or the Astringent – he considered sour and astringent as the same characteristic in two words.⁶⁸ He explained that those flavours or smells were mixtures that arise from the primary ones as a result of the combinations of different degrees of hot, cold, dry and moist.⁶⁹ Galen’s explanation might be the reason why they didn’t make any theory of tastes to distinguish foodstuffs and arrange seasonal regimen like ancient Indians and Chinese did.

8. CONCLUSIONS

With the above discussion, we may have a better understanding of the beginning questions. The Hippocratic authors regarded the changes of seasons as a cause of diseases, thus they paid much attention to the observation of stars, winds and rains. They recorded several cases about how to predict possible diseases by such observation, but they failed or never attempted to make out a general theory for meteorological prognosis. At the same time, although they had different explanations to the mechanism how the seasonal changes effected the bodily health, they generally had agreements on seasonal regimen. In order to prevent seasonal diseases, a strict seasonal regimen was recommended to counteract the effect of seasons, according to the theory of the four qualities and the doctrine of balance.

Compared to other works, the Hippocratic description of seasonal changes and seasonal regimen has its own uniqueness and its special meaning to some degree. The author of *Problemata* and Clesus surely followed the steps, but not all Greek physicians paid equal attention to the seasonal factors as did the Hippocratic authors. Although we can also find parallels in *Nei Jing* and *Caraka-Samhita*, they actually differ in important respects, especially on the matter of tastes. The Hippocratic authors belittled the tastes of foodstuffs, probably

⁶⁵ *De An.* 413b5-10.

⁶⁶ *De An.* 414b10-15.

⁶⁷ *De An.* 424b23-30.

⁶⁸ Powell, O. (2003), p33.

⁶⁹ Powell, O. (2003), p37.

because they regarded the qualities of tastes not as essential as the qualities of hot, cold, dry and moist.

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